Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (Canceled)

2. (Previously Presented) The method according to claim 42, wherein the primer is a fragment of deoxyribonucleic or ribonucleic acid, an oligodeoxyribonucleotide, an oligoribonucleotide, or a copolymer of deoxyribonucleic acid and ribonucleic acid.

3. (Previously Presented) The method according to claim 42, wherein the nucleic acid of interest is deoxyribonucleic acid, a ribonucleic acid, or a copolymer of deoxyribonucleic acid and ribonucleic acid.

4-7. (Canceled)

8. (Previously Presented) The method according to claim 42, wherein each dNTP is labeled with the same or different detectable label.

9. (Previously Presented) The method according to claim 42, wherein said detectable label comprises an enzyme, radioactive isotope, a fluorescent molecule, or a protein ligand.

10. (Canceled)

11. (Currently amended) The method according to claim 42, wherein said primer extension reaction occurs enzymatically using a template-dependent enzyme ~~is template-dependent~~.

12. (Original) The method of claim 11, wherein the template-dependent enzyme is DNA polymerase.

13. (Previously Presented) The method according to claim 12, wherein the DNA of polymerase is *E. coli* DNA polymerase I or a fragment thereof, T4 DNA polymerase, T7 DNA polymerase, or *T. aquaticus* DNA polymerase.

14. (Original) The method according to claim 11, wherein said enzyme is RNA polymerase or reverse transcriptase.

15. (Previously Presented) The method according to claim 42, wherein the primer comprises one or more moieties that permit affinity separation of the primer from the unincorporated reagent and/or the nucleic acid of interest.

16. (Previously Presented) The method according to claim 42, wherein the primer comprises one or more moieties that links the primer to a solid surface.

17. (Original) The method according to claim 15, wherein the moieties comprises biotin or digitonin.

18. (Original) The method according to claim 16, wherein the moieties comprises biotin or digitonin.

19. (Original) The method according to claim 15, wherein the moieties comprises a DNA or RNA sequence that permits affinity separation of the primer from the unincorporated reagent and/or the nucleic acid of interest via base pairing to a complementary sequence present in a nucleic acid attached to a solid support.

20. (Original) The method according to claim 16, wherein the moieties comprises a DNA or RNA sequence that permits affinity separation of the primer from the unincorporated reagent and/or the nucleic acid of interest via base pairing to a complementary sequence present in a nucleic acid attached to a solid support.

21. (Original) The method according to claim 15, wherein the moieties comprises a DNA or RNA sequence that allows the primer to link to a solid support via base pairing to a complementary sequence present in solid surface.

22. (Original) The method according to claim 16, wherein the moieties comprises a DNA or RNA sequence that allows the primer to link to a solid support via base pairing to a complementary sequence present in solid surface.

23. (Currently Amended) The method according to claim 42, wherein the nucleic acid ~~of interest~~sample has been synthesized enzymatically *in vivo*, *in vitro*, or synthesized non-enzymatically.

24. (Currently Amended) The method according to claim 42, wherein the nucleic acid ~~of interest~~sample is synthesized by polymerase chain reaction.

25. (Currently Amended) The method according to claim 42, wherein the nucleic acid ~~of interest~~sample comprises non-natural nucleotide analogs.

26. (Previously Presented) The method according to claim 25, wherein the nonnatural nucleotide analogs comprise deoxyinosine or 7-deaza-2'-deoxy-quanosine.

27. (Previously Presented) The method according to claim 42, wherein the sample comprises genomic DNA from an organism, RNA transcript thereof, or cDNA prepared from RNA transcripts thereof.

28. (Previously Presented) The method according to claim 42, wherein the sample comprises extragenomic DNA from an organism, RNA transcripts thereof, or cDNA prepared from RNA transcripts thereof.

29. (Previously Presented) The method according to claim 27, wherein the organism is a plant, microorganism, bacteria, or virus.

30. (Previously Presented) The method according to claim 28, wherein the organism is a plant, microorganism, bacteria, or virus.

31. (Original) The method according to claim 27, wherein the organism is a vertebrate or invertebrate.

32. (Original) The method according to claim 28, wherein the organism is a vertebrate or invertebrate.

33. (Original) The method according to claim 27, wherein the organism is a mammal.

34. (Original) The method according to claim 28, wherein the organism is a mammal.

35. (Original) The method according to claim 27, wherein the organism is a human being.

36. (Previously Presented) The method according to claim 28, wherein the organism is a human being.

37-41. (Canceled)

42. (Currently Amended) A method for detecting variations of a nucleotide at a defined site of a nucleic acid comprising:

(a) identifying a first form of a nucleic acid having a first nucleotide X at the defined site, wherein X is A, T, G, C, or U;

(b) performing a primer extension reaction on a nucleic acid sample containing a second nucleotide Y at the defined site using a primer extension reaction mixture comprising:

(i) a primer that hybridizes upstream of the defined site of the nucleic acid sample so that the first unpaired base immediately downstream of the 3' end of the primer is Y,

(ii) a nucleotide combination in which nucleotides complementary to X are omitted, the nucleotide mixture combination consisting of:

(1) dTTP or dUTP, dCTP, and dGTP when X is T and at least one of dTTP, dCTP, dGTP or dUTP is labeled with a detectable label, or

(2) dCTP, dGTP and dATP when X is A or U and at least one of dCTP, dGTP and dATP is labeled with a detectable label, or

(3) dGTP, dATP, and dTTP or dUTP when X is G and at least one of dGTP, dATP, and dTTP or dUTP is labeled with a detectable label, or

(4) dATP, dTTP or dUTP, and dCTP when X is C and at least one of dATP, dTTP or dUTP, and dCTP is labeled with a detectable label; and

[[(d)]] (c) analyzing the primer extension products formed in (b), wherein ~~the presence of a~~ labeled primer extension product ~~indicates that~~ results when Y ~~does not equal~~ and X are different nucleotides and wherein a primer extension product does not form when Y and X are the same nucleotide.

43. (New) A method for detecting or quantifying a variation of a target nucleotide in a target nucleic acid by detecting signal from a plurality of labeled nucleotides incorporated into a primer comprising: in a single reaction vessel

(a) annealing the primer and the target nucleic acid to form a duplex, wherein the primer's 3' end is positioned immediately adjacent to the target nucleotide and

wherein the target nucleotide is the first unpaired base immediately downstream of the 3' end of the primer;

(b) performing a chain termination reaction on the duplex using an unlabeled chain extension terminator nucleotide complementary to the target nucleotide, wherein incorporation of the chain terminator nucleotide terminates further chain extension of the primer and wherein the primer remains unlabeled when the target nucleic acid comprises the target nucleotide;

(c) performing a primer extension reaction on the duplex using a nucleotide combination in which nucleotides complementary to the target nucleotide are omitted, the nucleotide mixture combination consisting of:

(1) dTTP or dUTP, dCTP, and dGTP when the target nucleotide is T and at least one of dTTP, dCTP, dGTP or dUTP is labeled with a detectable label, or

(2) dCTP, dGTP and dATP when the target nucleotide is A or U and at least one of dCTP, dGTP and dATP is labeled with a detectable label, or

(3) dGTP, dATP, and dTTP or dUTP when the target nucleotide is G and at least one of dGTP, dATP, and dTTP or dUTP is labeled with a detectable label, or

(4) dATP, dTTP or dUTP, and dCTP when the target nucleotide is C and at least one of dATP, dTTP or dUTP, and dCTP is labeled with a detectable label; and

(d) detecting the labeled primer extension product comprising a plurality of labeled non-terminator nucleotides, wherein the labeled primer extension product only forms when the target nucleic acid has a variation of the target nucleotide.